

Please amend Claims 37, 39, 43 - 44, 46 - 47, and 49 as follows.

IN THE CLAIMS:

37. (Twice Amended / Currently Amended) An apparatus for processing a semiconductor wafer in a processing chamber, said apparatus comprising:

a gas panel coupled to said processing chamber;

an antenna proximate to said processing chamber;

37 a power supply coupled to said antenna; and

a controller, coupled to said antenna and said gas panel, said controller containing a computer readable storage medium having program code embodied therein, said program code for controlling the apparatus ~~in accordance with~~ to perform the following:

(a) loading a silicon-comprising substrate into a processing chamber having deposits on chamber surfaces which were generated during processing of a previous substrate;

(b) conducting ~~an~~ at least one etch process on said loaded silicon-comprising substrate which simultaneously removes at least a portion of said deposits from said chamber surfaces during said etch, wherein a plasma source gas used to generate an etchant plasma is furnished to said processing chamber via said gas panel, and wherein said power supplied to generate and maintain said plasma is furnished to said processing chamber by said power supply coupled to said antenna; and

(c) controlling said power supply to provide energy to said antenna proximate to said processing chamber, thereby effecting the removal of said deposits from said chamber surfaces.

38. (Previously Added) The apparatus of Claim 37, wherein said etch process is a plasma etch process.

39. (Previously Added / Currently Amended) The apparatus of Claim 38, wherein said etch process comprises plasma etching a layer of silicon nitride ~~formed on~~ which is part of said silicon-comprising substrate.

40. (Previously Added) The apparatus of Claim 39, wherein said plasma source gas comprises a fluorine-containing compound and a bromine-containing compound.

41. (Previously Added) The apparatus of Claim 40, wherein said fluorine-containing compound is SF₆.

42. (Previously Added) The apparatus of Claim 40, wherein said bromine-containing compound is HBr.

43. (Previously Added / Currently Amended) The apparatus of Claim 37, wherein said previous substrate ~~comprises~~ comprised silicon, and wherein said processing of said previous substrate ~~comprises~~ included plasma etching said ~~silicon~~ silicon-comprising previous substrate, whereby a portion of said ~~silicon~~ silicon-comprising previous substrate is was removed, and during which deposits on chamber surfaces were formed.

B/ 44. (Previously Added /Currently Amended) The apparatus of Claim 43, wherein plasma etching of said ~~silicon~~ silicon-comprising substrate is performed using a plasma source gas comprising a halogen-containing compound and oxygen.

45. (Previously Added) The apparatus of Claim 44, wherein said halogen-containing compound is HBr.

46. (Previously Added/Currently Amended) The apparatus of Claim 43, wherein said processing of said previous substrate ~~comprises~~ included plasma etching an upper portion of a trench in said ~~silicon~~ silicon-comprising previous substrate using a plasma source gas comprising a fluorine-containing compound and oxygen, during which deposits on chamber surfaces were formed.

47. (Previously Added / Currently Amended) The apparatus of Claim 43, wherein etching of said ~~silicon~~ silicon-comprising substrate is performed using a plasma source gas which includes at least three

reactive gases which include at least one fluorine-containing compound which does not contain silicon, at least one silicon-containing compound, and oxygen.

48. (Previously Added) The apparatus of Claim 47, wherein a volumetric ratio of said at least one fluorine-containing compound which does not contain silicon to said at least one silicon-containing compound ranges from about 100:1 to about 1:10.

49. (Previously Added / Currently Amended) The apparatus of Claim 46, wherein said processing of said previous silicon-comprising substrate further ~~comprises~~ includes plasma etching a lower portion of said trench in said silicon substrate using a plasma source gas which ~~includes~~ includes at least three reactive gases which ~~include~~ includes at least one fluorine-containing compound which does not contain silicon, at least one silicon-containing compound, and oxygen.

50. (Previously Added) The apparatus of Claim 47, wherein said silicon-containing compound is selected from the group consisting of SiF_4 , Si_2F_6 , SiHF_3 , SiH_2F_2 , SiH_3F , Si_2OF_6 , SiCl_2F_2 , SiClF_3 , and combinations thereof.

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51. (Previously Added) The apparatus of Claim 49, wherein said silicon-containing compound is selected from the group consisting of SiF_4 , Si_2F_6 , SiHF_3 , SiH_2F_2 , SiH_3F , Si_2OF_6 , SiCl_2F_2 , SiClF_3 , and combinations thereof.

52. (Previously Added) The apparatus of Claim 47, wherein said silicon-containing compound does not contain fluorine and is selected from the group consisting of SiBr_4 , SiHBr_3 , SiH_2Br_2 , SiH_3Br , SiCl_4 , SiHCl_3 , SiH_2Cl_2 , SiH_3Cl , Si_2Cl_6 , SiH_4 , Si_2H_6 , Si_3H_8 , Si_4H_{10} , SiH_2I_2 , SiH_2I , $\text{C}_4\text{H}_{12}\text{Si}$, $\text{Si}(\text{C}_2\text{H}_3\text{O}_2)_4$, and combinations thereof.

53. (Previously Added) The apparatus of Claim 49, wherein said silicon-containing compound does not contain fluorine and is selected from the group consisting of SiBr_4 , SiHBr_3 , SiH_2Br_2 , SiH_3Br , SiCl_4 ,

SiHCl₃, SiH₂Cl₂, SiH₃Cl, Si₂Cl₆, SiH₄, Si₂H₆, Si₃H₈, Si₄H₁₀, SiH₂I, SiH₂I, C₄H₁₂Si, Si(C₂H₃O₂)₄, and combinations thereof.

54. (Previously Added) The apparatus of Claim 47, wherein said fluorine-containing compound which does not contain silicon is selected from the group consisting of F₂O, F₂O₂, NF₃, NOF, NO₂F, SF₆, SF₄, S₂F₂, S₂F₁₀, CF₄, CH₂F₂, CHF₃, CH₃F, and combinations thereof.

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a/ 55. (Previously Added) The apparatus of Claim 49, wherein said fluorine-containing compound which does not contain silicon is selected from the group consisting of F₂O, F₂O₂, NF₃, NOF, NO₂F, SF₆, SF₄, S₂F₂, S₂F₁₀, CF₄, CH₂F₂, CHF₃, CH₃F, and combinations thereof.
